– DRAFT –
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# SECOND GENERATION OF FREE-FLYING MAGNETOMETER: SYSTEM ON A CHIP IMPLEMENTATION

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## ABSTACT

A Free-Flying Magnetometer (FFM) is an autonomous spin-stabilized "sensorcraft" that measures vector magnetic field at dc and low frequencies by means of a 3-axis magnetometer. Multiple FFMs are deployed to provide synchronized multipoint magnetic field measurements. These kinds of measurements are enabling new science by determining the fine-scale structure of the currents in the ionosphere involved in the production of aurora. The Jet Propulsion Laboratory (JPL) recently developed a "hockey puck" FFM using Commercial Off The Shelf (COTS) technology. This FFM design was successfully demonstrated as part of the Enstrophy sounding rocket mission. This paper discusses the first generation hockey-puck FFM and its planned future development. A second generation FFM design targeted at further miniaturization and enhancements in functionality are possible through the use of monolithic magnetometers, Systems On a Chip (SoC) technology, and advanced packaging.